difficult to associate the transactions measured at higher aggregation points with a mobility pattern tracked in an RRC trace. Furthermore the needed information in the RNCs is stored in a vendor-specific manner. Therefore, a measurement system that can be used in any type of UTRAN cannot be based on extracting information from the RNC. Yet another drawback is that, in order to ensure network security, safe operation of network nodes, and the like, operators typically do not allow for measuring teams (which may be external) to access important network nodes such as the RNC. Therefore, a solution with passive tapping at a standardized network interface is favored.

International Patent Application WO 01/95657 A2 appears to disclose a system and method for monitoring communications in a cellular telecommunication network and associated core network. When an access network sets up a communication with a mobile station, the access network sends a report message to the core network with an identity of the access network. However, there is no disclosure or suggestion of sending cell-level location information, or using this information to determine network performance.

United States Patent Application Publication 2002/0155825 A1 appears to disclose a method and system for providing a service to a mobile subscriber in a network. Specific information, which may include the location of the mobile subscriber, is provided to a service provider, which generates an individual service message on the basis of the provided information. However, there is no disclosure or suggestion of using cell-level location information to determine network performance.

International Patent Application WO 02/39673 A1 appears to disclose a method and system for identifying and determining degradation of the quality of service (QoS) perceived by a subscriber in a network such as the Internet. Traffic of individual applications of the subscriber and aggregate traffic of the subscriber are monitored, captured, and processed to produce QoS statistics. However, this document is applicable to the Internet, but there is no disclosure or suggestion of using cell-level location information to determine network performance.

Thus there is a particular need for a cost-effective passive monitoring method that can be applied in the current mobility management architecture of UMTS networks.

SUMMARY OF THE INVENTION

The present invention is directed to a location-signaling system and method for large-scale end-to-end quality-of-service monitoring of packet switched telecommunications networks. The invention is especially useful for Universal Mobile Telecommunications System (UMTS) networks in which the detailed mobility information is only available in an access network where the level of aggregation is not sufficient for reliable passive measurement-based characterization. An important advantage of the invention is that only a few measurement points are needed. It is also advantageous that the existence of the cell-level location information in the UTRAN-to-core-network communication can be switched off in regular operation so that no extra load is generated in the network, and the operation of the network is left unchanged.